

(ii) Other pipe in the bottom tier may also be held in place by blocks and/or wedges; and

(iii) Every pipe in the bottom tier must also be held firmly in contact with the adjacent pipe by tiedowns through the front and rear pipes:

(A) At least one tiedown through the front pipe of the bottom tier must run aft at an angle not more than 45 degrees with the horizontal, whenever practicable.

(B) At least one tiedown through the rear pipe of the bottom tier must run forward at an angle not more than 45 degrees with the horizontal, whenever practicable.

(2) *Use of tiedowns.* (i) Each pipe may be secured individually with tiedowns through the pipe.

(ii) If each pipe is not secured individually with a tiedown, then:

(A) Either one 1/2-inch diameter chain or wire rope, or two 3/8-inch diameter chain or wire rope, must be placed longitudinally over the group of pipes;

(B) One transverse tiedown must be used for every 3.04 m (10 ft) of load length. The transverse tiedowns may be placed through a pipe, or over both longitudinal tiedowns between two pipes on the top tier.

(C) If the first pipe of a group in the top tier is not placed in the first well formed by pipes at the front of the tier beneath, it must be secured by an additional tiedown that runs rearward at an angle not more than 45 degrees to the horizontal, whenever practicable. This tiedown must pass either through the front pipe of the upper tier, or outside it and over both longitudinal tiedowns; and

(D) If the last pipe of a group in the top tier is not placed in the last well formed by pipes at the rear of the tier beneath, it must be secured by an additional tiedown that runs forward at an angle not more than 45 degrees to the horizontal, whenever practicable. This tiedown must pass either through the rear pipe of the upper tier or outside it and over both longitudinal tiedowns.

(f) *Securing large pipe, with an inside diameter over 1143 mm (45 in).* In addition to the requirements of paragraphs (b), (c) and (d) of this section, the following rules must be satisfied:

(1) The front pipe and the rear pipe must be immobilized by blocking, wedges, vehicle end structure, stakes, locked pipe unloader, or other equivalent means.

(2) Each pipe must be secured by tiedowns through the pipe:

(i) At least one tiedown through each pipe in the front half of the load, which includes the middle one if there is an odd number, and must run rearward at an angle not more than 45 degrees with the horizontal, whenever practicable.

(ii) At least one tiedown through each pipe in the rear half of the load, and must run forward at an angle not more than 45 degrees with the horizontal, whenever practicable, to hold each pipe firmly in contact with adjacent pipe; and

(iii) If the front or rear pipe is not also in contact with vehicle end structure, stakes, a locked pipe unloader, or other equivalent means, at least two tiedowns positioned as described in paragraphs (f)(2)(i) and (ii) of this section, must be used through that pipe.

(3) If only one pipe is transported, or if several pipes are transported without contact between other pipes, the requirements in this paragraph apply to each pipe as a single front and rear article.

§ 393.126 What are the rules for securing intermodal containers?

(a) *Applicability.* The rules in this section apply to the transportation of intermodal containers. Cargo contained within an intermodal container must be secured in accordance with the provisions of §§ 393.100 through 393.114 or, if applicable, the commodity specific rules of this part.

(b) *Securement of intermodal containers transported on container chassis vehicle(s).* (1) Each intermodal container must be secured to the container chassis with securement devices or integral locking devices that cannot unintentionally become unfastened while the vehicle is in transit.

(2) The securement devices must restrain the container from moving more than 1.27 cm (1/2 in) forward, more than 1.27 cm (1/2 in) aft, more than 1.27 cm (1/2 in) to the right, more than 1.27 cm (1/2 in) to the left, or more than 2.54 cm (1 in) vertically.

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(3) The front and rear of the container must be secured independently.

(c) *Securement of loaded intermodal containers transported on vehicles other than container chassis vehicle(s).* (1) All lower corners of the intermodal container must rest upon the vehicle, or the corners must be supported by a structure capable of bearing the weight of the container and that support structure must be independently secured to the motor vehicle.

(2) Each container must be secured to the vehicle by:

(i) Chains, wire ropes or integral devices which are fixed to all lower corners; or

(ii) Crossed chains which are fixed to all upper corners; and,

(3) The front and rear of the container must be secured independently. Each chain, wire rope, or integral locking device must be attached to the container in a manner that prevents it from being unintentionally unfastened while the vehicle is in transit.

(d) *Securement of empty intermodal containers transported on vehicles other than container chassis vehicle(s).* Empty intermodal containers transported on vehicles other than container chassis vehicles do not have to have all lower corners of the intermodal container resting upon the vehicle, or have all lower corners supported by a structure capable of bearing the weight of the empty container, provided:

(1) The empty intermodal container is balanced and positioned on the vehicle in a manner such that the container is stable before the addition of tiedowns or other securement equipment; and,

(2) The amount of overhang for the empty container on the trailer does not exceed five feet on either the front or rear of the trailer;

(3) The empty intermodal container must not interfere with the vehicle's maneuverability; and,

(4) The empty intermodal container is secured to prevent lateral, longitudinal, or vertical shifting.

§ 393.128 What are the rules for securing automobiles, light trucks and vans?

(a) *Applicability.* The rules in this section apply to the transportation of

automobiles, light trucks, and vans which individually weigh 4,536 kg. (10,000 lb) or less. Vehicles which individually are heavier than 4,536 kg (10,000 lb) must be secured in accordance with the provisions of § 393.130 of this part.

(b) *Securement of automobiles, light trucks, and vans.*

(1) Automobiles, light trucks, and vans must be restrained at both the front and rear to prevent lateral, forward, rearward, and vertical movement using a minimum of two tiedowns.

(2) Tiedowns that are designed to be affixed to the structure of the automobile, light truck, or van must use the mounting points on those vehicles that have been specifically designed for that purpose.

(3) Tiedowns that are designed to fit over or around the wheels of an automobile, light truck, or van must provide restraint in the lateral, longitudinal and vertical directions.

(4) Edge protectors are not required for synthetic webbing at points where the webbing comes in contact with the tires.

§ 393.130 What are the rules for securing heavy vehicles, equipment and machinery?

(a) *Applicability.* The rules in this section apply to the transportation of heavy vehicles, equipment and machinery which operate on wheels or tracks, such as front end loaders, bulldozers, tractors, and power shovels and which individually weigh 4,536 kg (10,000 lb.) or more. Vehicles, equipment and machinery which is lighter than 4,536 kg (10,000 lb.) may also be secured in accordance with the provisions of this section, with § 393.128, or in accordance with the provisions of §§ 393.100 through 393.114.

(b) *Preparation of equipment being transported.* (1) Accessory equipment, such as hydraulic shovels, must be completely lowered and secured to the vehicle.

(2) Articulated vehicles shall be restrained in a manner that prevents articulation while in transit.

(c) *Securement of heavy vehicles, equipment or machinery with crawler tracks or wheels.* (1) In addition to the requirements of paragraph (b) of this section,